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A LOOK BEYOND THE BLACK BOX

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War games are currently enjoying a revival of interest and popularity within the American defense community. Strategists, analysts, and policy-makers alike are turning more and more to gaming as a medium for education, planning and discovery. This paper examines war gaming as a tool for strategic planning and offers a perspective different (yet complementary) to that of operations research: the war game is viewed as a source of synthetic history, to be studied and interpreted by historical-type methods.

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UNLOCKING THE POTENTIAL OF WAR GAMES: A LOOK BEYOND THE BLACK BOX

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War games are currently enjoying a revival of interest and popularity within the American defense community. Strategists, analysts, and policy-makers alike are turning more and more to gaming as a medium for education, planning and discovery. War games facilitate multi-dimensional examination of strategic issues without risk and at relatively little expense:

> Gaming provides a means of gaining useful experience and information in advance of an actual commitment, of experimenting with forces and situations that are too remote, too costly or too complicated to mobilize and manipulate, and of exploring and shaping the organizations and systems of the future. (McHugh, 1966, p. 1-25)

In an era obsessed with "static measures" and "bean counts," wargaming offers a critical yet refreshing opportunity to study the dynamic qualities of strategy, tactics, and military-political affairs.

The word "game" has a number of meanings, several of which are relevant to defense policy studies. Broadly speaking, a game is a competition between two or more decision centers, none having perfect intelligence on the other (Quade, 1975, p. 199). A more refined definition, and one of greater significance to the strategist, specifies the game as a competitive or conflict situation in which opposing human players influence events with their own decisions.

Two important categories of gaming are the "war game" and the "strategic game." The war game is simply a game that simulates political or military conflict without operating real forces. The strategic, or political-military game is a type of war game that examines a full range of political, military, economic, and social issues with regard to a nation's overall security policy (Brewer and Shubik, 1979, p. 377). Within the context of this paper, all gaming is regarded as a human function; every game must contain some explicit decisionmaking by one or more human players.

WAR GAMING AS A SUPPLEMENT TO ANALYSIS

With its roots in physical science, analysis assists in policy formulation by applying empirical procedures:

> The physical sciences are the paradigm of analysis. Analysts build mathematical models of reality, take measurements to quantify the parameters of the models, and manipulate both models and parameters to learn about reality or to find the "best" solutions to the problems it poses. (Perla and Branting, 1986, p. 2)

Despite its ability to scientifically examine many elements of policy, analysis comes up short on matters outside the physical paradigm. When confronted with unquantifiable phenomena, such as most human behavior, analysts must either exclude them or simplify them beyond recognition. Analysis cannot effectively reduce the complex and often imprecise nature of human behavior to a series of algorithms. This is especially true in situations of human conflict, where analysis, by itself, ". . . can provide

little insight into why and how a brilliant hunch, or incredible blunder, a bold gamble, or paralyzing indecision can destroy carefully crafted plans or turn ad hoc operations into decisive victories." (Perla and Barrett, 1985b, p. 78)

But gaming can capture some properties of human behavior (knowledge, emotion, character, etc.) that may lead to decisive victories or ignoble defeats. While analysis focuses on physical phenomena, gaming emphasizes "human" matters by considering phenomena that defy quantification. War games can augment analysis by providing a practical and plausible, if subjective, basis for policy: "important perceptual and procedural matters surface in the play of manual scenario games; they almost never do in computer-based analysis." (Brewer, 1984, p. 807)

War games do not simply address physical parameters and processes with mathematical models. By placing real people in decisionmaking roles, games "model" human parameters and processes. If analysis is the stepchild of physical science, gaming is more closely related to history and the historical paradigm. The human thought processes found in games resemble those of actual human history in that causation, motivation, and contingency are key elements. Players must make and live with the consequences of their game decisions much as they would in the real world. War games thus provide artificial experience, as players learn from the decisionmaking opportunities they encounter during play. Games can also be used as sources of

synthetic history, to be studied and evaluated by analysts and strategists using the methods of a historian.

Analyses are designed to simplify variables and focus narrowly on specific pieces of reality, and analytic procedures must be replicable to be useful. They are performed over and over following rigid, predetermined event sequences. Using this iterative approach, data may be progressively manipulated and refined in pursuit of an optimized outcome. Thus tangible, substantial results are produced by analysis, and they are frequently expressed in the form of a model.

In contrast, gaming is process-oriented. Replication may not be as important as realism, so games usually feature a dynamic, unpredictable course of events that better approximate real human affairs. As a result, strategic games permit players and policy-makers to concentrate on broad issues rather than precisely defined variables. Optimization is less appropriate in these types of political-military games; the best games provide a wide variety of issues and potential developments for the strategist to ponder.

Gaming and analysis each function well within its own paradigm. If analysis often fails to provide the policy-maker with practical insight, gaming cannot always address important matters more suited to quantification. In truth, the prudent analyst and wise strategist will use both approaches to develop policy:

> Large-scale political and operational decisions modeled, however imperfectly, in a wargame can

> sometimes have more important effects on the conduct and utility of an operation than the detection range of a sonar or the probability of accurate weapons placement given detonation. Yet, without the understanding of the latter factors provided by good analysis, the decisions can be too abstract, too sterile, and their effects assumed rather than assessed. The gaming and analysis pieces must fit together. (Perla and Branting, 1986, p. 10)

USING WAR GAMES

Despite their limitations, war games can produce unique and illuminating perspectives on many complex security issues. Such games offer a multi-dimensional medium for education, planning and discovery, largely because of their ability to capture and convey qualities beyond the reach of conventional analytic techniques.

While recognizing the substantial potential of war games, caution must nevertheless be exercised in their application. Too much faith in any single methodology, including gaming, is often a mistake. Strategists and analysts should both remember that games simply cannot address every aspect of the problems they may confront.

"In general," comments Robert Mandel, "war games appear most necessary when other approaches to military analysis are costly, risky, ethically controversial, or simply unavailable." (Mandel, 1985, p. 485) If *rigor* and replication are needed, as in the study of phenomena subject mainly to the physical paradigm, treatment with analytical methods is probably more in order. This is because the "human" factor so important to games also

renders them unsuitable tools for purely empirical studies. In a war game, it is virtually impossible to fully control variables and reproduce results with precision. First, busy schedules make it difficult to gather the exact same players for repeat games. Second, as a person gains experience in a game, his judgment and decisionmaking is inevitably influenced by familiarity with game context and mechanics, as well as by knowledge of previous game outcomes. Thus, even if the same people are available to participate in multiple iterations of a game, the analyst/ strategist can never be sure how much their decisions are affected by learning derived from earlier play. Even the best validation techniques cannot begin to separate "game wise" decisions from authentic ones under such circumstances.

If, on the other hand, the topics under consideration are related more to the historical paradigm, the methodology of gaming is entirely appropriate. Precision and replicability are not necessarily prerequisites for meaningful examination of many qualitative strategic issues, and it is to the study of these hard-to-measure attributes that war games should be utilized.

Having determine the applicability of the war game to the issues at hand, the strategist/analyst must design and conduct his gaming with care. Human nature being what it is, the artificialities of gaming are sometimes easy to overlook, especially in a well-developed game with highly believable scenarios and mechanics: "War games attempt to create the illusion of reality and where this has been done successfully,

the game can be a powerful and sometimes insidious influence, especially on those who have limited operational experience." (Perla and Barrett, 1985b, p. 77). Thus the war game is a double-edged sword. Where it can impart a sense of reality to otherwise recondite ideas, it can also, if used carelessly, create an aura of illusion.

In his study entitled Unintended Consequences of Strategic Gaming, Paul Bracken identifies three undesirable results fostered by war games and simulations, or rather their misapplication: unintended learning, diverted attention, and suppressed possibilities (Bracken, 1977, pp. 312-315). These represent some of the more deleterious effects of gaming.

Many war games are intended to serve the purposes of education or advocacy: they are designed to teach specific lessons to participants. Extra caution must be exercised by the designers and users of such games, lest they backfire and foster unintended and undesired learning. Games are powerful tools, and the wrong lessons and wrong conclusions can make just as strong an impression as the "right" ones.

A war game that "proves" or "disproves" the efficacy of a plan, tactic, or strategy should be regarded with extreme skepticism, as it may deceive the strategist/analyst by diverting his attention from other important issues. Since it cannot address every determinant of political-military affairs, a single game (or even a series of games) cannot be taken as the final word on a given matter. The strategist/analyst must realize that

the war game is not a "test" in the sense of an absolute standard meant to be passed or failed. Instead it is a way to examine the qualities of an idea or strategy. War games do not prove anything, but they do suggest how an idea might play out in a dynamic real-world setting. Gaming should engender questions and hypotheses, not answers and proofs. Rather than divert attention away from seemingly "resolved" issues, proper understanding and application of gaming methodology will raise issues to be evaluated by other means.

Game-induced distortions may result in the inadvertent suppression of certain future possibilities and outcomes. For this reason, the strategist should not use gaming as a methodology for prediction. War games are simply too vulnerable to subjective inauthenticities to be effective forecasting devices. Indeed, many types of political-military games intentionally incorporate unpredictability into their designs so as to better approximate actual human conditions. Excessive belief in game results is usually a recipe for self-deception and unrealistic policy: the strategist ". . . cannot blithely treat the game experiences as if they were the same as corresponding experiences in the real world." (Thompson, 1983, p. 87) Gaming is best employed as a means to build and explore alternative scenarios of the future, not as a crystal ball.

THE ROLE OF THE STRATEGIST

Much recent research on war games is the product of operations research analysts educated in quantitative methodologies. Whereas most analysts think of gaming in terms of results, rigor, and rationality, it is often necessary to look beyond the "Black Boxes" that typify a purely analytic orientation. Full exploitation of the war game's potential requires more than a set of proven algorithms: unmeasurable, qualitative factors must also be accounted for. Such "squishy" factors are fundamental to the strategist, versed as he is in history and military-political affairs. Consequently, strategists should play a major role in the design, play, and study of war games.

Historically oriented and political-militarily educated strategists must more fully investigate the theory, applications, and epistemology of war games if they are to unlock the best potential of gaming methodology. The objective of their research is a better understanding of the impact of game artificialities, and how to compensate for them with proper validation procedures.

Some experts suggest that various elements of analytical theory are relevant to games: organizational theory, small group theory, communications theory, and decision theory, to name a few (deLeon, 1981, p. 214). But war game theory, as distinct from that of analysts, is ". . . primarily a coherent body of wisdom, characterized by judgment rather than analysis--in the narrowest sense of that term." (Brewer and Shubik, 1979, p. 72) The contribution of analysis, and analytic theory, to gaming is

unequivocal, but it is just as important, and perhaps more illuminating, to subject the war game to historical study and historical theorizing. The historical paradigm is built on human judgment, as is the war game, so the wise strategist will rely on history, as well as analysis, for developing his theories of war gaming.

Automated models are becoming more practical, flexible, and transparent, and more widely used in war games. Although they are not a cure-all, careful application of state-of-the-art computer technologies do hold promise for many types of strategic games. Computerized games, if conducted properly, enable the strategist to examine more issues in less time and with more (but not too much) precision than completely manual methods. Fast, sophisticated systems like the Rand Strategy Assessment Center (RSAS) are capable of performing as players and/or as Control in large-scale, aggregated game situations that might normally take man-years of effort to conduct with strictly human play. An especially fertile application may emerge when such automated systems are wedded to other types of games. For example, the RSAS would likely perform well as a scenario generator or an adjudication device for a global war game.

With the surge of potentially useful information emanating from both computerized and manual war games, methods to extract game knowledge must be formulated. In effect, the strategic community must construct an epistemology of gaming. "No one," concluded Brewer and Shubik in 1979, "is certain about what game

players, builders, and users, are actually getting out of play, construction or use of these devices." (Brewer and Shubik, 1979, p. 73) This statement apparently still holds true nine years later, in light of the relative dearth of studies that deal with information from war games.[1] It seems that much work remains to be done to build a body of knowledge derived from gaming.

To encourage proper examination and interpretation of war game knowledge, every game should incorporate complete documentation and a formal analysis plan. Larger game facilities may benefit even further by developing an organization like the Analysis Group found at the Naval War College's Global War Game, devoted entirely to the study of war game information. Participants can assist in the work of these groups by keeping "battle diaries": notes made during actual game play of their observations, thoughts, reasoning, and decisions (Perla, 1986, p. 30). Moreover, personnel charged with documenting game results would do well to adopt a report format that would facilitate later research.

Because of the war game's correspondence to the historical paradigm, a war game report "should more closely resemble an historical treatise than the documentation of a campaign

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[1]Several notable strategic/political-military studies using war game information do exist in the open literature. Some outstanding examples include: Brown, T.A. and Paxson, E.W., A Retrospective Look at Some Strategy and Force Evaluation Games, Rand Corporation Report P-1619-PR, September 1975; Mandel, Robert, "Political Gaming and Foreign Policy Making During Crises," World Politics, V. 29, pp. 610-625, July 1977; and Vlahos, Michael, The Blue Sword: The Naval War College and the American Mission, 1919-1941, Naval War College Press, 1980.

analysis." (Perla and Barrett, 1985a, p. 20) Like good analytical history, it will examine causal factors and motivations as well as simple event sequences. As a minimum, game documentation should include:

- a statement of game objectives, and an outline of how the game's design satisfies those objectives;
- a description of the game scenario, making underlying assumptions as explicit as possible;
- a brief description of the game's models, emphasizing their use and possible impacts on play, and explaining their basic assumptions;
- a general chronology of game events;
- discussion and historical-type analysis of causation and motivation behind game events;
- investigation of seemingly unusual, chance, or contingency events, and how they affected game play;
- lessons learned; not "proofs" of theories and hypotheses, but rather issues, broader insights, and generalizations raised or suggested by the study of game events and decisions; and
- topics and possible hypothesis to be researched further or examined in future games.

With the availability of comprehensive, well-documented information from war games, a number of new possibilities emerge for strategic studies:

- In-depth examination of a given series of games, specifically to identify and assess salient patterns and ideas.
- Research to compare and contrast past games to actual historical events. The underlying reasons for divergences and similarities between real and fictitious events may provide greater insight into the actual behavior of international actors.
- Comparative studies of different types of war games dealing with similar issues. For example, the strategist may want to compare the results of an RSAS game with those of a seminar game. Besides surfacing important new issues, such studies enhance the validity of both kinds of games.

These are just a few of the sorts of studies made possible by gaming (if documentation is properly prepared), and the imaginative strategist will undoubtedly conceive of additional research designs.

Gaming methodology is a unique and important tool for the strategist/historian. Because of ". . . its ability to help us understand better the roles, capabilities, and limitations of that most ubiquitous warfighting system, the human being," the war game "is a powerful and effective learning device." (Perla and Barrett, 1985a, p. 18) Games are used within the defense community to educate and advocate, to plan and to organize thinking, and to help defray new ideas and insights. They offer a means to train present and future planners, negotiators, and

policy-makers to grasp the dynamics of international relations and strategic thought. They also facilitate examination of numerous topics of more immediate strategic interest.

War games give the strategist largely unmatched ability to safely explore a host of momentous questions: what are the relationships between protracted conventional war and nuclear war? How can conventional operations impact the strategic nuclear balance? What types of command, control, and communications limitations might the National Command Authority face in operating strategic forces after a massive nuclear attack? How can the superpowers safely transition to security postures based on strategic defenses? What are the merits of a maritime strategy versus a continental strategy? What sorts of competitive strategies seem most promising for future development? How might military, political, economic, and social forces be employed to achieve national goals in crisis situations short of war? What kinds of long-term strategies and policies seem appropriate for dealing with non-superpower nations and other international actors? What are the political and military implications of different arms control regimes? What are potentially fruitful techniques to employ when negotiating arms control? Collective security agreements? War termination? How might domestic political imperatives be addressed in defense policies? What preparations must be made in peacetime for effective mobilization in the face of crisis or conflict?

The list of issues is seemingly endless, and gaming is a methodology well-suited to explore many of them.

It is imperative that the strategist become involved with the new gaming techniques being introduced today, and he must lead the way in development of a war game epistemology to unlock the potential of these new techniques. By projecting his history-based perspective into gaming methodology, the strategist can augment the analyst by exerting a realistic, balancing influence on defense decisionmaking. Gaming, like all efforts to improve defense policy-making, is not a panacea, but it may help responsible officials reduce uncertainties and hopefully introduce better decisions into an already complex process. In this way, national security policy may move beyond bean counts and black boxes into the realm of true strategy.

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